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STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte BHANWAR SINGH,
SRIKANTESWARA DAKSHINA-MURTHY,
KHOI A. PHAN, BHARATH RANGARAJAN,
and RAMKUMAR SUBRAMANIAN

Appeal 2008-6065
Application 10/768,515
Technology Center 1700

Decided:¹ March 24, 2009

Before CHARLES F. WARREN, TERRY J. OWENS, and
MICHAEL P. COLAIANNI, *Administrative Patent Judges*.

OWENS, *Administrative Patent Judge*.

DECISION ON APPEAL
STATEMENT OF THE CASE

The Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's rejection of claims 1-8, which are all of the pending claims. We have jurisdiction under 35 U.S.C. § 6(b).

¹ The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, begins to run from the Decided Date shown on this page of the decision. The time period does not run from the Mail Date (paper delivery) or Notification Date (electronic delivery).

The Invention

The Appellants claim a mask comprising light-absorbing material on at least one vertical sidewall of a three-dimensional feature. The Appellants state that the mask is useful for nanoprint lithography (Spec. 1:6-8). Claim 1 is illustrative:

1. A mask comprising:

a translucent substrate;

one or more three-dimensional features comprising one or more vertical sidewalls;

an absorbing material deposited upon one or more of the vertical sidewalls so that light in an incident direction to an upper surface of the substrate will be absorbed by the absorbing material, resulting in light blocking features; and

one or more horizontal surfaces, formed upon one or more of the three-dimensional features, that allow light rays to exit a lower surface of the substrate unobstructed by the absorbing material.

The References

Vasudev (Vasudev '824)	5,411,824	May 2, 1995
Takemura	5,530,265	Jun. 25, 1996
Hashimoto	5,786,114	Jul. 28, 1998
Aggas (Aggas '157)	5,994,157	Nov. 30, 1999
Aggas (Aggas '590)	6,020,590	Feb. 1, 2000
Yeh	2003/0193068 A1	Oct. 16, 2003
French	2006/0051974 A1	Mar. 9, 2006
		(filed Jun. 13, 2003)
Vasudev (Vasudev '450)	WO 94/17450	Aug. 4, 1994

Grant & Hackh's Chemical Dictionary (Grant) 261, 487 (5th ed., McGraw-Hill 1987).

The Rejections

The claims stand rejected as follows: claims 1 and 3 under 35 U.S.C. § 102(b) over Vasudev '450 or Vasudev '824; claim 2 under 35 U.S.C. § 102(b) over Vasudev '450 or Vasudev '824 or, in the alternative, under 103 over Vasudev '450 or Vasudev '824, each in view of Grant; claims 4 and 8 under 35 U.S.C. § 103 over Vasudev '450 or Vasudev '824, each in view of Hashimoto; claim 5 under 35 U.S.C. § 103 over Vasudev '450 or Vasudev '824, each in view of Takemura or French; claim 6 under 35 U.S.C. § 103 over Vasudev '450 or Vasudev '824, each in view of Aggas '157 or Aggas '590; and claim 7 under 35 U.S.C. § 103 over Vasudev '450 or Vasudev '824, each view of Yeh.

OPINION

We affirm the Examiner's rejections.

The Appellants argue only claim 1, which is the sole independent claim (Br. 3-7; Reply Br. 2-5). Claim 3, which is rejected over the same prior art as claim 1, is not separately argued and, therefore, falls with claim 1. *See* 37 C.F.R. § 41.37(c)(1)(vii) (2007). Although additional references are applied to claims 2 and 4-8, the Appellants do not provide a substantive argument as to the separate patentability of those claims but, rather, rely upon their arguments regarding claim 1 (Br. 6-7; Reply Br. 4-5). Hence, for the reasons given with respect to claim 1, we are not persuaded of reversible error in the rejections of claims 2 and 4-8. Accordingly, we address only claim 1.

Issue

Have the Appellants shown reversible error in the Examiner's determination that Vasudev '450 and Vasudev '824 disclose, expressly or inherently, a mask comprising a light-absorbing material on one or more vertical sidewalls so that light in an incident direction to an upper surface of the mask's translucent substrate will be absorbed by the light-absorbing material, resulting in light-blocking features?

Findings of Fact

Vasudev '450 discloses a phase-shifting mask comprising a glass or quartz substrate (11) having trenches (12) therein with light-absorbing/attenuating vertical sidewalls (31) formed by applying to the sidewalls a light-absorbing material such as molybdenum, chromium, aluminum, gold, and their alloys and silicides (p. 8, ll. 22-25; p. 9, l. 33 – p. 10, l. 8; p. 12, ll. 13-15; p. 13, ll. 26-31; p. 14, l. 37 – p. 15, l. 19; Fig. 2B). Light rays are substantially absorbed by the light-absorbing sidewalls instead of being scattered due to the effects of the sidewalls (p. 10, ll. 13-18).

Vasudev '824, which is a priority document for Vasudev '450, includes a comparable disclosure (col. 3, ll. 38-41; col. 4, ll. 14-26, 30-35; col. 5, ll. 30-32; Fig. 2B).

Analysis

“Anticipation requires that every limitation of the claim in issue be disclosed, either expressly or under principles of inherency, in a single prior art reference.” *Corning Glass Works v. Sumitomo Elec. U.S.A., Inc.*, 868 F.2d 1251, 1255-56 (Fed. Cir. 1989).

The Appellants argue that “Applicant’s claimed invention relates to a *mask for a nanoprint lithographic process*” (Br. 4), and that Vasudev’s mask is disclosed as a phase-shifting mask rather than a patterning mask (Br. 5; Reply Br. 3).

That argument is not well taken because the Appellants are arguing a limitation which is not in the claims. *See In re Self*, 671 F.2d 1344, 1348 (CCPA 1982). The Appellants’ claims to “[a] mask” encompass Vasudev’s phase-shifting mask.

The Appellants argue that Vasudev contemplates only absorbing or attenuating light internal to a phase-shifting mask, and does not disclose or suggest blocking light in an incident direction to an upper surface of the mask to result in light blocking features (Br. 5).

The Appellants’ claim 1 limitation “so that light in an incident direction to an upper surface of the substrate will be absorbed by the absorbing material, resulting in light blocking features” sets forth a required property of the light-absorbing vertical sidewalls, i.e., they must be capable of absorbing light in that manner. Vasudev’s light-absorbing/attenuating sidewalls are comparable to those of the Appellants in structure and composition. Consequently, like the Appellants’ sidewalls having light-absorbing material deposited on them, Vasudev’s light-absorbing/attenuating sidewalls are capable of absorbing light incident upon the upper surface of the mask’s substrate.

The Appellants argue that considering Vasudev’s light-absorbing/attenuating sidewalls to be inherently capable of light

blocking features would destroy the disclosed functionality of the device (Br. 5).

The Appellants do not explain, and it is not apparent, how pointing out an inherent property of a mask can destroy its disclosed functionality.

Conclusion of Law

The Appellants have not shown reversible error in the Examiner's determination that Vasudev '450 and Vasudev '824 disclose, expressly or inherently, a mask comprising a light-absorbing material on one or more vertical sidewalls so that light in an incident direction to an upper surface of the mask's translucent substrate will be absorbed by the light-absorbing material, resulting in light-blocking features.

DECISION/ORDER

The rejections of claims 1 and 3 under 35 U.S.C. § 102(b) over Vasudev '450 or Vasudev '824, claim 2 under 35 U.S.C. § 102(b) over Vasudev '450 or Vasudev '824 or, in the alternative, under § 103 over Vasudev '450 or Vasudev '824, each in view of Grant, claims 4 and 8 under 35 U.S.C. § 103 over Vasudev '450 or Vasudev '824, each in view of Hashimoto, claim 5 under 35 U.S.C. § 103 over Vasudev '450 or Vasudev '824, each in view of Takemura or French, claim 6 under 35 U.S.C. § 103 over Vasudev '450 or Vasudev '824, each in view of Aggas '157 or Aggas '590, and claim 7 under 35 U.S.C. § 103 over Vasudev '450 or Vasudev '824, each in view of Yeh are affirmed.

It is ordered that the Examiner's decision is affirmed.

Appeal 2008-6065
Application 10/768,515

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

PL Initial:
sld

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